6.0 PROGRAM MANAGEMENT PLAN AND SCHEDULE

This section specifies the management structure and the roles of CCOS committees and working groups. It also specifies the responsibilities of field study participants and schedule of milestones for the CCOS field study and related activities.

6.1 CCOS Management Struture

The CCOS is a large-scale program involving many sponsors and participants. Three entities are involved in the overall management of the Study. The San Joaquin Valleywide Air Pollution Study Agency, a joint powers agency (JPA) formed by the nine counties in the Valley, directs the fund-raising and contracting aspects of the Study. A Policy Committee comprised of four voting blocks: State, local, and federal government, and the private sector, provides guidance on the Study objectives and funding levels. The Policy Committee approves all proposal requests, contracts and reports. A Technical Committee parallels the Policy Committee in membership and provides overall technical guidance on proposal requests, direction and progress of work, contract work statements, and reviews of all technical reports produced from the study. The leadership roles in the CCOS field study include the principal investigators, the field coordinator, the quality assurance officer, the data manager, the measurement investigators, the CCOS/CRPAQS technical committee, and the CCOS/CRPAQS policy committee. On a day-to-day basis, the California Air Resources Board (ARB) is responsible for management of the Study under the direction of the Program Manager, Chief of the Modeling and Meteorology Branch, in the ARB's Planning & Technical Support Division.

6.1.1 Policy Committee

The policy committee is composed of senior management representatives from local, state, and federal regulatory agencies and private sector stakeholders. It provides overall policy and financial direction to the project. Specifically, the Policy Committee will:

- Evaluate CCOS technical components for their relevance to future policy decisions and assure an adequate balance among those components.
- Monitor CCOS budgets, schedules, and product quality to assure fiduciary responsibility and fulfillment of commitments.
- Request, justify, and obtain sufficient sponsorship to complete defined activities that will achieve CCOS objectives.
- Review and evaluate policy-relevant CCOS findings, provide constructive recommendations for their expression, and convey these findings to stakeholders.

6.1.2 Technical Committee

The CCOS is directed by a technical committee that comprises staff from the California Air Resources Board (ARB), the California Energy Commission (CEC), local air pollution control agencies, industry, and other sponsoring organizations with technical input from a

consortium of university researchers in California and the Desert Research Institute (DRI). Members are listed on the title page of this conceptual program plan. This committee provides overall technical direction to the project. Specifically, the technical committee has the following role.

- Reviews each of the plans and recommends the final technical scope of each of these program elements.

- Prepare and disseminate requests for proposals for necessary work elements and evaluate the proposals received.

- Commission and evaluate CCOS technical reports and publications, including those relevant to field studies.

- Create and monitor overall project schedules and budgets, evaluate compromises between project needs and budget allocations, and institute remedial actions where needed.

- Institute, facilitate, and coordinate CCOS research activities with complementary activities sponsored by the local air quality management districts (i.e. BAAQMD), California Air Resources Board, U.S. Environmental Protection Agency (Region IX, ORD, and OAQPS), the Department of Defense (Naval Weapons Center), Department of Agriculture, and industrial research sponsors (EPRI, CRC, WSPA, API).

- Participate in, to the extent possible, CCOS data acquisition, data analysis, and modeling activities.

- Disseminate CCOS scientific findings in scientific forums, national guidance documents, and peer-reviewed publications.

6.1.3 Principal Investigators

The principal investigators provide scientific and technical guidance for the Central California Ozone Study. Specifically, the principal investigators will:

- Create initial study protocols for data analysis, modeling, emissions characterization, and field studies, and modify them in response to external evaluation and technical support study results.

- Assist in the preparation of work statements for complex project components.

- Critically review CCOS technical products and provide constructive recommendations for improvement and focus on CCOS goals and objectives.

- Keep informed of developments and findings in PM programs external to CCOS and incorporate that knowledge into CCOS planning and execution.

- Devise and refine conceptual models of elevated PM2.5 and PM10 in central California and assess the extent to which mathematical models simulate the physical and chemical mechanisms embodied in these concepts.

- Periodically integrate CCOS findings into summary reports and publications that are scientifically rigorous and policy-relevant.

- Disseminate CCOS scientific findings in scientific forums, national guidance documents, and peer-reviewed publications. Promote and facilitate the dissemination of specific research projects among other CCOS participants.

6.1.4 Meteorological Working Group

A Meteorological Working Group has been established to update information regarding the meteorological scenarios associated with ozone exceedances in various areas of the modeling domain. This group will evolve into the formation of the CCOS forecast team. The forecast team develops the Forecast Plan in conjunction with the field manager, reviews meteorological data, and provides consensus forecasts to program management. The forecast team also documents the daily meteorological conditions during 1997. This team includes representatives from the ARB, BAAQMD, SMAQMD, and SJVUAPCD.

6.1.5 Emissions InventoryWorking Group

There are about 30 districts in the CCOS modeling domain. Each local air district in the state updates a portion of the emission inventory for their area. To help coordinate this effort, the Emission Inventory Coordination Group (EICG) has been established to determine the process for preparing the emission inventories needed to support air quality modeling for CCOS. Participants in the group include many local air districts, several local councils of government, Caltrans, California Energy Commission, and the ARB. Local air districts participating to date include San Joaquin Valley Unified APCD, Bay Area AQMD, Sacramento Metropolitan AQMD, Mendocino County AQMD, Northern Sierra AQMD, Yolo-Solano AQMD, Placer County APCD, San Luis Obispo County APCD, and Monterey Bay Unified APCD. Other local air districts will also be participating.

6.1.6 Field Coordinator

The implementation of the experimental phase of the program plan will be the responsibility of the field coordinator. Success of the field measurement program depends on proper preparation, effective communications, and timely documentation. When handled properly, most field management is done before the beginning of the study. Communication channels are established, siting is arranged, and procedures and schedules are formalized. Coordination among participating groups is initiated through a field study protocol that sets suitable schedules to maximize the benefits of coordinated measurements while minimizing the potential interferences among measurements. During the study, oversight by the FM ensures the quality of the data collected. The field coordinator is responsible for seeing that the planned quality assurance program is implemented, measurement plans are followed, and corrective action is taken immediately as problems arise. The field coordinator also is responsible for

documenting measurement activities and presenting a description of the field program activities in a formal report.

The most important aspects of the field management effort are: field operations protocol; siting; communications; oversight of measurements and QA activities; and documentation of measurements and activities. The field operations protocol is a short document that serves as the guide for those in the field. It should be a concise overview of the field study, enumerating the most pertinent information needed by those conducting the measurements. The contents would include: (1) a brief summary of the study objectives; (2) a list of the measurements; (3) a schedule of measurements; (4) a roster of participants; (5) a description of sites; (6) a description of communications channels; (7) protocols for determining and announcing intensive measurement periods; (8) an outline of deployment and operational logistics; (9) an outline of on-site quality assurance activities; (10) basic rules regarding site access and operations; and (11) reporting procedures. This document lists telephone numbers and addresses for sites, update lines, and field contacts for the participants.

Several planning activities by the field coordinator are needed for the preparation of the field operations protocol. The field coordinator must determine the optimum schedules for coordinating measurements, taking into account both program objectives and logistical considerations. These decisions will be made in consultation and close cooperation with those who formulate program study design. Additionally, the field coordinator has the task of ensuring that potential cross-contamination between measurements is eliminated.

As part of the preparation of the field operations protocol, the field coordinator would be required to design an effective protocol for handling the scheduling of intensive measurement periods. Clean, effective handling of the forecasting and intensive scheduling can reduce the cost of the study and improve the data quality. Participants must be given a window of time during which intensive studies will be scheduled, and the announcement of those intensive studies must be done as soon as possible, based on daily forecasts by meteorologists assigned to this task.

Siting of the measurements, including access, security, and electrical power, as well as location, is extremely important. In addition to the selection of the general location desired for the study measurements, siting criteria must include maintaining distance from immediate sources, such as streets, paint shops, or dry cleaners. Existing monitoring sites are desirable because such siting criteria have been met, because of the existing ozone, nitrogen oxides, and meteorological measurements at these sites, and because of the historical record of pollutant concentrations. Whenever possible, the field coordinator will work in cooperation with the ARB and AQMDs. The necessary lead time can become quite lengthy and must be anticipated in the planning. Indeed, securing sites becomes the most immediate priority, and this should begin even before the program plan is approved.

In addition to finding suitable study sites, the role of siting also includes obtaining all necessary permits, meeting indemnification and insurance requirements for access, ensuring compliance with local and state environmental and safety regulations, and arranging for study needs at the site, including power and telephone. The direct costs of these items (such as

insurance premiums, electrical contracting etc.) should be the responsibility of the sponsors. However, the field coordinator will act in the role of facilitator.

Complete and clear communications before, during, and after the field study are key to a successfully coordinated field study program. Before the study, participants must be clearly informed of their roles and of the study protocols. The field study protocol document referred to above is an important communications instrument. In the weeks just prior to the field deployment, a communications center will need to be established in the study region. A telephone message machine will communicate the daily status of the study. Participants will be instructed to call in each day and to leave a message on the telephone tape machine briefly stating their operational status. In this way, the project manager knows exactly who has been informed and can respond to problems or follow up with those who have not reported. The phone machine system has the advantages that it can be accessed from any public phone, and that parties can "report in" at the time they receive their daily update. Additionally, a network communications tree should be established, such that the field coordinator will be in direct contact with a designated representative of each of the measurement groups. For intensive studies, daily contact with the major participating groups is anticipated. A computer bulletin board or WEB page may be established but the telephone answering machine will to be the primary means of disseminating information. Communications at the conclusion of the study are important for complete and accurate documentation of study activities and for initiating data reporting procedures.

During the field measurement phase of the study, the field coordinator is responsible for coordinating activities among the participating groups, and for ensuring that measurement and quality assurance activities are completed as planned. As problems arise, they must be dealt with in a timely fashion. The field coordinator is responsible for monitoring accomplishments against the milestones of the program plan, identifying impediments to attaining those milestones and creating liaisons among project participants in order to remove those impediments. Additionally, the field coordinator will maintain a log of measurement and quality assurance activities, as well as a record of all daily forecasts and special events.

At the end of the study, the field coordinator must coordinate a smooth evacuation of the sites, ensure that sites are left in order and that owners of the sites are thanked in writing for their assistance to the project. The field coordinator must follow up with each of the study participants to verify the record of measurements made at the site, and to disseminate information regarding the reporting of data. A data manager should be selected before the completion of the study, and the field coordinator will work with that person to disseminate information regarding data reporting before the end of the study. Additionally, as soon after the study as possible the field coordinator will supply to the data manager and project directors a summary list of measurements, including schedules on which they were performed and by whom, as well as a list of the quality assurance audits performed in the field.

Finally, the field coordinator will compile this information into a report of field measurement activities. This report will include site descriptions and a list of participants and measurement activities, as well as a daily log of events during intensive studies. It will incorporate the relevant information from the field protocol document, as well as the pertinent

information from the field project log including but not limited to daily forecasts, and a daily log of measurement activities.

Specifically, the field coordinator will:

- Assist in field study planning, specifically keeping current the measurement locations, measurement methods, and quality assurance, schedule, and budget sections of this plan.
- Prepare work statements for different components of the field measurement program.
- Procure information needed to evaluate measurement method feasibility, practicality, and costs and make judgements concerning the costs vs. benefits of new measurement technology.
- Select sampling sites based on the monitoring purposes and criteria stated in this plan and document those sites with respect to their location and surroundings.
- Specify siting, electrical, communications and environmental requirements for each sampling site and procure the necessary permits, power, and security to operate those sites.
- Recruit, train (in collaboration with measurement investigators) and direct site operators. Monitor operator quality, in collaboration with measurement investigators, and take remedial actions where needed.
- Establish an efficient communications network, including a project roster of names, addresses, phone numbers, fax numbers, and e-mail addresses among other field study participants and apply that network to convey needed information among the participants.
- Participate in the evaluation of technical proposals from measurement investigators and provide perspective on the likelihood that different measurement alternatives to accomplish objectives.
- Identify and resolve communications difficulties among measurement investigators, the data manager, and the quality assurance officer to assure that audit findings are corrected and documented and that data flow efficiently and smoothly into the project database.
- Organize a forecasting team to determine the initiation and end of intensive operating periods during winter, develop a forecasting protocol, and implement it during the winter study. Develop a protocol to disseminate go/nogo and abort decisions.
- Document field study activities and accomplishments after its completion.
- Prepare a site report

6.1.7 Quality Assurance Officer

The quality assurance officer provides direction, coordination, and documentation of measurement accuracy, precision, and validity. Specifically, the quality assurance officer will:

- Prepare a quality assurance program plan that specifies systems and performance auditing methods, intercomparison methods, primary and transfer standards, schedules, audit reporting formats, feedback to measurement investigators, and methods to verify that remedial actions have been taken.

- Assemble and direct a quality assurance team with specialized expertise and equipment in evaluating precision, accuracy, and validity of established and developing measurement methods. Deploy this team to conduct systems and performance audits, assemble the results, provide feedback to measurement investigators, and verify that remedial actions have been implemented.

- Analyze data from collocated or nearby air quality and meteorological measurement systems to estimate precision, equivalence, and predictability among measurements. Identify environmental and atmospheric composition conditions under which values for these attributes are acceptable and unacceptable.

- Identify, obtain, and evaluate standard operating procedures for methods to be applied during field studies.

- Evaluate data qualification statements prepared by measurement investigators.

6.1.8 Data Manager

- The data manager will establish and maintain computer-based data archives and communications. Specifically, the data manager will:

- Review and revise the data management section of this plan as changes are made to data reporting, structure, and retrieval conventions.

- Define and procure hardware and software needed to successfully complete the data management tasks.

- Prepare statements of work and direct data management support investigators to assist in the accomplishment of data management tasks.

- Establish a CCOS web page with links to: 1) long-term data archives; 2) electronic copies of CCOS reports and documents (electronic form); 3) CCOS participants' roster, roles, and websites (where available); and 4) standard operating procedures; 5) data receipt archives; 6) CCOS field study data archives; and 7) measurement sites and observables.

- Develop, apply, and document efficient and modern methods for receiving, processing, and delivering data from and to measurement, data analysis, and modeling investigators.

- Perform Level 1B validation tests. Apply Level II and III validation adjustments and flags.

- Transmit the final data base to the NARSTO data archive.

6.1.9 Measurement Investigators

Measurement investigators are responsible for specialized CCOS measurements. Specifically, measurement investigators will:

- Specify and procure (or construct) monitoring devices and verify their adequacy for operation under conditions anticipated during CCOS field monitoring.

- Specify for the field coordinator space, power, sample presentation, supplies, storage, shipping/receiving, environmental, and communications requirements for each monitoring site at which the investigator's measurements will be acquired.

- Develop or adapt standard operating procedures and checklists and participate in training of site operators, or supply specially-trained site operators as needed.

- Install and calibrate instruments at the measurement sites and remove them after study completion.

- Supply expendables needed to maintain measurement schedules.

- Monitor network operations, in collaboration with the field coordinator, identify and remediate deficiencies.

- Evaluate and remediate system and performance audit findings and document that remediation.

- Regularly acquire raw measurements to evaluate monitor performance. Periodically reduce data, validate it at Level 1A, and deliver it in the prescribed formats to the data manager.

- Prepare a summary of monitoring methods, data and validation results, and measurement activities when measurements have been completed. Prepare data quality statements that evaluate the accuracy, precision, validity, and completeness of the measurements acquired during each phase of the field study.

6.1.10 Data Analysis and Modeling Investigators

Data analysis and modeling investigators will use the integrated data set to perform Level 2 and Level 3 data validation, to further answer the questions posed in Section 3, and to develop, evaluate, and apply source and receptor models. Several of the data analysis activities, especially those involved with determining Level 2 validation status of measurements and descriptive analysis of the measurements, are best performed by the measurement investigators. Specifically, data analysis and modeling investigators will:

- Evaluate the consistency of measurements, i.e. Level 2 validation.
- Describe statistical, temporal, and spatial distributions of measurements on average and during episodes.
- Interpret data to answer questions in Section 3.
- Recommend revisions to the conceptual models in Section 3, elaborating on the dominance and validity of chemical and physical mechanisms and the importance of different pollution sources.
- Use field measurements in meteorological and air quality source and receptor models to evaluate the extent to which they represent the identified mechanisms and emissions.
- Use field measurements to establish base cases for annual average and several different episodes of maximum concentration to evaluate the effects of different emissions reduction strategies.
- Identify data deficiencies and initiate Level 3 validation checks and corrections with the data manager.

6.2 Schedule

Table 6.2-1 provides milestones for CCOS field study and related activities. This schedule should be integrated with the master project schedule that includes emissions and modeling activities. This schedule will be maintained by the field coordinator and made more specific as planning progresses. The overall time scale shown is four years. To meet this schedule, however, will require careful planning, fast turn-around by the sponsors on requests for proposals and contracts, and much front-end work by the Technical Committee. In the early stages of the program, several tasks must be performed in parallel, and the technical committee and working groups must meet frequently and coordinate closely. Once the field study is underway, less effort is required of the sponsors and committees. The quality assurance and data managers should be selected as soon as the general scope of the field study is defined.

Table 6.2-1 CCOS Schedule of Milestones

Activity/Milestone	Completion Date
Planning	
Preparation of preliminary scope of work by ARB.	1/31/99
Technical Committee (TC) meeting in Sacramento – upper air network.	3/26/99
TC meeting in Sacramento – emission inventory development.	4/14/99
TC meeting in Sacramento – review of past studies and conceptual model.	5/3/99
TC and SAW meeting in Rocklin – DRI present draft Conceptual Program Plan	6/11/99
Revised draft of Conceptual Program Plan available on CCOS web site	9/7/99
Release requests for proposals for field operations	11/15/99
Final Field Study Plan available on CCOS web site	11/30/99
Selection of supplemental monitoring sites	12/15/99
Contractor selection	1/7/00
Executable Contracts	2/15/00
CCOS Field Study Operational Plan and Protocol	4/27/00
CCOS Field Measurement	
Field coordination meeting in Sacramento	mid-May/00
Field measurements begin	6/15/00
Field measurements end	9/15/00
Draft documentation of field activities by DRI	10/15/00
Final summary of field monitoring activities by DRI	12/15/00
Data Validation, Data Analysis and Modeling	
Quality audit report by QA Contractor	12/15/00
Level 1 Data Archive	4/31/01
Level 2 Data Validation	6/30/01
Data Analysis/Emissions/Modeling	
Data analysis	12/31/01
Emission inventory development	9/31/01
Model improvements	9/31/01
Base-case simulations (model performance, diagnostic/sensitivity testing)	3/31/02
Future year emission inventory and sensitivity simulations	9/30/02